



December 8, 2022
Kleinfelder Project No.: 20232926.001A

Mr. Jared Hall
Community and Economic Development Director
Murray City Public Services
4646 South 500 West
Murray, Utah 84123

**SUBJECT: NOVEMBER 2022 SEMI-ANNUAL BARRIER MONITORING REPORT
 MURRAY COSTCO WHOLESALE WAREHOUSE #764
 5201 SOUTH INTERMOUNTAIN DRIVE
 MURRAY, UTAH 84107**

Dear Mr. Hall:

This report documents the surface barrier monitoring and storm drain inspections conducted by Kleinfelder personnel at the Murray Costco Wholesale Warehouse (Site) referenced above on November 21, 2022.

The ground surface barriers were inspected according to the Site Barrier Maintenance and Monitoring Plan (BMMP), dated August 8, 2002, and amended January 22, 2003 and June 6, 2016. The inspection included visually examining nine stormwater catch basins, as identified in Addendum 2 of the BMMP, and ground surface barriers, noting defects (if any), and making recommendations for repairs, if required. Information collected during the inspection was recorded on the Barrier Inspection Checklist, Review Checklist, and the Catch Basin Inspection Checklist provided in Attachment A. A Site map indicating the stormwater catch basin locations and observations of note are also included in Attachment A. In general, typical wear and tear was observed on the Site landscaping, asphalt, and concrete barriers, as described in this report. No breaching of the surface barriers or storm drains was observed during the inspection that would expose potential receptors, and the Site surface barriers appear to be managed and maintained in accordance with the BMMP.

LANDSCAPING BARRIERS

During the November inspection, the landscaping barriers did not display signs of erosion, landscaping damage from vehicles, excavations, or differences in barrier elevations with standing water, channels in the soil, or damaged, missing, or ineffective erosion control systems.

ASPHALT BARRIERS

During the November inspection, asphalt barriers had minor damage due to shallow cracks indicative of normal wear, some of which had been sealed with tar. Some cracks were observed in the tar seals. Several areas of asphalt damage were observed in the northern and southern asphalt parking lot areas where asphalt adjoins concrete drainage features. The cracks depicted on Figure 1 ranged from ¼ inch to 1 ½ inches in depth and ½ inch to 1 inch across. The cracks indicated on Figure 1 were not observed to have breached the asphalt barrier and exposed soil that would present an exposure risk to potential receptors and are typical in asphalt pavements given Utah's climate and the related freeze and thaw cycles. The asphalt is monitored regularly and repaired annually, or more frequently if significant damage is observed. If Kleinfelder or Costco observes significant damage that could potentially expose receptors to underlying soil such as a pothole, those locations will be recorded and repaired as they are discovered.

CONCRETE BARRIERS

The observed concrete damage on the curbs, as noted on Figure 1, did not appear to extend to, or expose, the underlying soil. The remainder of the concrete barriers, including gutters and loading platforms, were generally in good condition with sealed concrete joints. No cracks, holes, settlement areas, or other physical features that would indicate the integrity of the barrier had been compromised were observed during the barrier inspection. No warehouse building concrete maintenance actions appear to be necessary at this time.

CATCH BASIN INSPECTION

Select stormwater catch basins (CBs) were inspected to assess whether groundwater was leaking into the storm drain system via breaches in the catch basin walls. Based upon previous Site investigations and storm drain repairs, inspections of CB1 through CB9 were included as part of the Site BMMP. Inspection and reporting requirements are outlined in Addendum 2 to the BMMP, dated June 6, 2016.

Standing water was observed in eight of the nine inspected catch basins at the approximate level of the inlet and outlet piping. Some dampness and/or water staining was observed on the CB2 and CB3 western sidewalls, originating from joints approximately 3 feet below ground surface (above the depth to groundwater). The dampness/staining was generally observed on the portions of the catch basins adjacent to frequently irrigated areas and not on the walls opposite the irrigated areas. The damp catch basin walls/minor water seepage are not anticipated to impact storm water quality within the drains due to the limited volume of water observed (i.e. no flowing water observed, and the dampness did not extend to the existing standing water levels), and because the seepage occurred above the groundwater table, which has been historically reported at depths approximately 8 to 10 feet below ground surface. Minor water seepage did not appear to originate from the depth of metals-impacted groundwater, which likely is present at the approximate depth extent of the catch basins, or

deeper. Kleinfelder and Costco will continue to monitor the catch basins for seepage during future Site inspections. Additional repairs will be conducted, as necessary. The November Catch Basin Inspection Checklist is included in Attachment A.

SITE BARRIER REPAIR WORK

Maintenance of the Site pavement appeared to have been performed to repair cracks, primarily in the northeast portion of the Site. Concrete damage reported in the May 2022 was observed to have been repaired or replaced on the underground storage tank concrete pad. Repairs were conducted in CB2, CB3, CB4, CB5, CB6, CB7, CB8, CB11, CB14, and CB22 in October 2022. Concrete grout was placed in concrete joints and cracks at depths ranging from approximately 3 inches to 6 feet below ground surface. No changes occurred to barrier types and locations.

MONITORING INSPECTION SCHEDULE

Costco's owner representative will continue to conduct barrier inspections on a semi-annual basis to ensure the barriers are maintained in a manner that prevents human exposure to subsurface soils. The next inspection is scheduled in Spring 2023.

LIMITATIONS

This work was performed in a manner consistent with that level of care and skill ordinarily exercised by other members of Kleinfelder's profession practicing in the same locality, under similar conditions and at the date the services are provided. Our conclusions, opinions and recommendations are based on a limited number of observations and data. It is possible that conditions could vary between or beyond the data evaluated. Kleinfelder makes no other representation, guarantee or warranty, express or implied, regarding the services, communication (oral or written), report, opinion, or instrument of service provided.

This report may be used only by the Client and the registered design professional in responsible charge and only for the purposes stated for this specific engagement within a reasonable time from its issuance, but in no event later than one (1) year from the date of the report.

The work performed was based on project information provided by Client and Murray City. If Client does not retain Kleinfelder to review any plans and specifications, including any revisions or modifications to the plans and specifications, Kleinfelder assumes no responsibility for the suitability of our recommendations. In addition, if there are any changes in the field to the plans and specifications, Client must obtain written approval from Kleinfelder's engineer that such changes do not affect our recommendations. Failure to do so will vitiate Kleinfelder's recommendations.

Please contact Jill Hernandez at 801.261.3336 if you have any questions or need additional information.

Respectfully submitted,

KLEINFELDER



Katherine Meyer
Staff Professional I



Jill Hernandez, PE
Project Manager

Attachment A: Inspection Records, November 21, 2022
 Barrier Inspection Checklist
 Barrier Corrective Action Record
 Review Checklist
 Barrier Inspection Site Map
 Catch Basin Inspection Checklist
 Photographic Log

cc: John Ellingsen – Costco Wholesale Director | Real Estate Development
 Diane Carter – Costco Wholesale Real Estate Manager
 Chad Efnor – Costco Warehouse #764 Administrative Manager
 Tiffany Caton – Costco Warehouse #764 General Manager
 Michael Storck – Utah DERR Project Manager
 Sydney Chan – EPA Project Manager
 Paolo Dizon – Kleinfelder Project Manager



KLEINFELDER

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Attachment A

ATTACHMENT A

Inspection Records, November 21, 2022

Barrier Inspection Checklist
Barrier Corrective Action Record
Review Checklist
Barrier Inspection Site Map
Catch Basin Inspection Checklist
Photographic Log

COSTCO Wholesale Warehouse Barrier Inspection Checklist

Date: November 21, 2022

Inspector: Katherine Meyr

Barrier Type: Interior Landscaping

Is the barrier in place and properly maintained: Yes ☒ No ☐ Not Applicable ☐

Observations/Comments: Good condition

Barrier Type: Perimeter Landscaping

Is the barrier in place and properly maintained: Yes ☒ No ☐ Not Applicable ☐

Observations/Comments: Good condition

Barrier Type: Concrete Surfaces

Is the barrier in place and properly maintained: Yes ☒ No ☐ Not Applicable ☐

Observations/Comments:

Overall good condition, some damage/chipping on curbs around interior landscaping indicated on map. Not significant enough to allow receptors to be exposed to impacted soil since the chips are above level of landscaping

Barrier Type: Asphalt Pavement - North Lot

Is the barrier in place and properly maintained: Yes ☒ No ☐ Not Applicable ☐

Observations/Comments: Overall fair condition with minor cracks in the asphalt and tar seals; however, cracks did not breach the barrier or expose underlying soils. Crack dimensions indicated on the map ranged from 1/4 to 1-1/2 inch deep and 1/4 to 1 inch wide, but did not extend the full width of the asphalt.

Barrier Type: Asphalt Pavement - South Lot

Is the barrier in place and properly maintained: Yes ☒ No ☐ Not Applicable ☐

Observations/Comments: Overall fair condition with minor cracks in the asphalt and tar seals; however, cracks did not breach the barrier or expose underlying soils. Crack dimensions indicated on the map ranged from 1/4 to 1-1/2 inch deep and 1/4 to 1 inch wide, but did not extend the full width of the asphalt.

Barrier Type: _____

Is the barrier in place and properly maintained: Yes ☐ No ☐ Not Applicable ☐

Observations/Comments: _____

Inspection Results:

The barriers remain intact. Damage to the asphalt barrier that were observed were minor and will continue to be monitored and maintained on a regular basis.

**COSTCO Wholesale Warehouse
Barrier Corrective Action Record**

Instructions: Complete this form for corrective actions required by the site inspection to ensure adherence to the Barrier Monitoring and Maintenance Plan.

Date: November 21, 2022

Inspector: Katherine Meyr

Barrier Type and Location: Catch Basins

Observations/Comments: _____

Dampness, minor seepage, and/or cracks were observed in catch basins 1, 2, 4, 6, 7, and 8 during the May 2022 inspection.

Corrective Actions Taken: _____

Grout has been placed in CB2, CB3, CB4, CB5, CB6, CB7, CB8, CB11, CB14, and CB22 in concrete joints and cracks at depths ranging from approximately 3 inches to 6 feet below ground surface in October 2022 since the May 2022 inspection.

Barrier Type and Location: Asphalt Pavement - North Lot

Observations/Comments: _____

Costco conducts annual asphalt pavement maintenance. Sealed cracks were observed by Kleinfelder during this monitoring event.

Corrective Actions Taken: _____

Kleinfelder personnel observed tar sealant had been placed since the May 2022 inspection, primarily in the asphalt near the gas station and through traffic areas

Barrier Type and Location: Concrete Pavement - Gas Station

Observations/Comments: _____

Minor concrete damage that did not extend the full width of the pavement in the gas station area was observed in the gas station area during the May 2022 inspection.

Corrective Actions Taken: _____

Concrete was repaired or replaced in the gas station area since the May 2022 inspection.

Barrier Type and Location: _____

Observations/Comments: _____

Corrective Actions Taken: _____

Other Comments: _____

COSTCO Wholesale Warehouse
Annual Barrier Monitoring and Maintenance Plan
Review Checklist

Instructions: The Barrier Monitoring and Maintenance Plan is to be reviewed on an annual basis to ensure that all sections of the plan are up-to-date and that all barriers are being appropriately maintained and managed. This form is to be completed fully to facilitate the annual review process. A "yes" response to any of the first three review questions will require the Barrier Monitoring and Maintenance Plan to be revised accordingly.

Date: November 21, 2022

Reviewer: Katherine Meyr

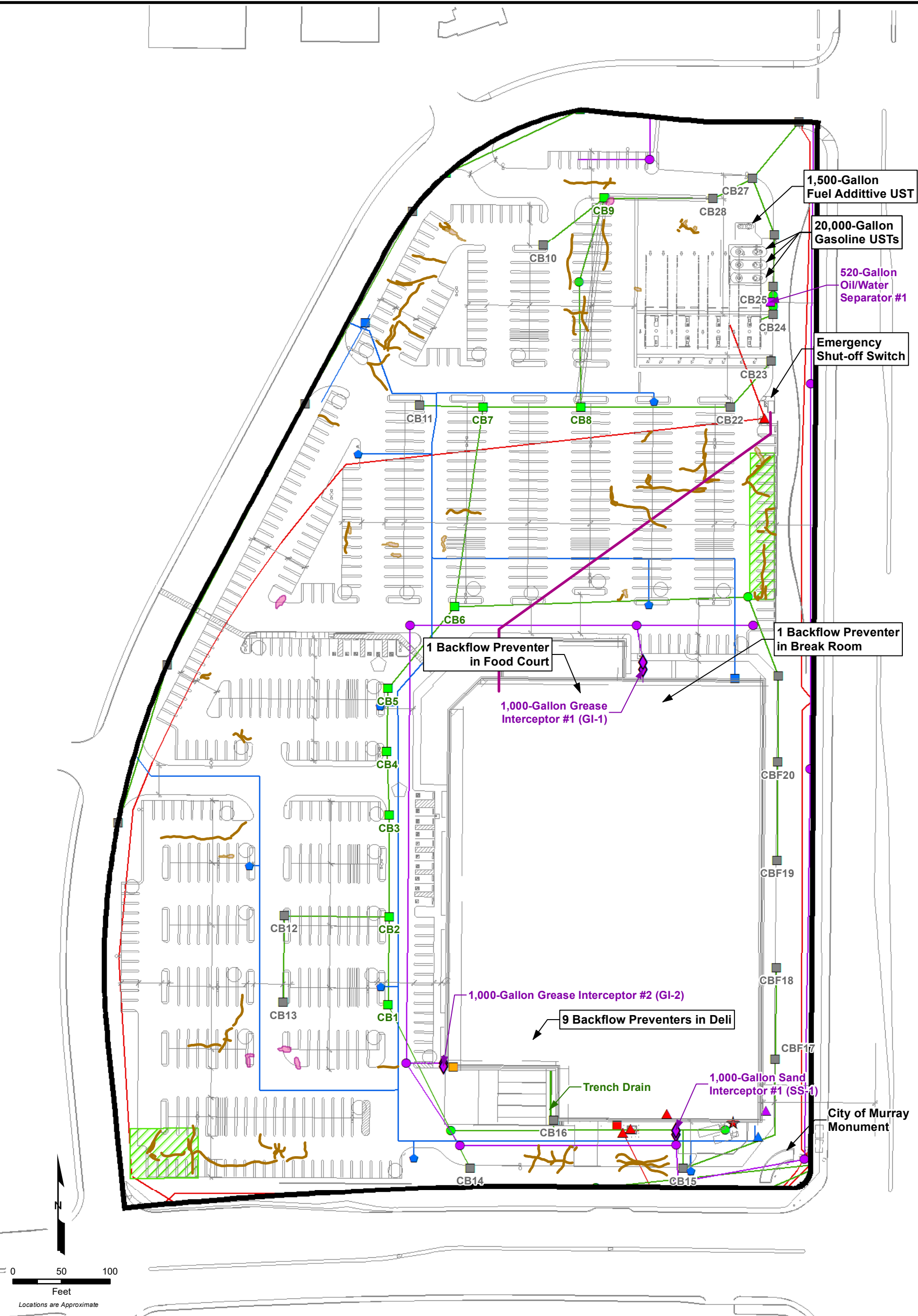
Have there been changes to the barrier types and/or locations? _____
No changes observed

Have there been any changes in the personnel responsible for conducting the inspections of the barriers?
No changes in personnel since the May 2022 inspection.

Other changes? _____

Are the barriers being properly maintained? _____
The barriers are observed to be properly maintained.

Additional comments not requiring changes in the Barrier Monitoring and Maintenance Plan: _____



Explanation

Approximate Site Boundary	Concrete Damage	Electric	Gas	Water	Sewer	Storm
Concrete Damage	Cracked Sealant or Pavement	Transformer	Gas Meter	Post Indicator Valve	Sewer Manhole	Snow Storage Area
Cracked Sealant or Pavement		Generator		Fire Hydrant	Fire Sprinkler Drain	Storm Manhole
		Electric Meter		Water Meter	Oil/Water Separator	Catch Basin (Inspected)
					Grease/Sand Trap	Catch Basin
CB = Catch Basin CBF = Catch Basin with Filter UST = Underground Storage Tank						

Basemap: Mulvanny G2, Existing Site Plan, October 2, 2014.
Utilities: City of Murray, Utah

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CHECKED BY:	JH
FILE NAME:	Figure1_2022Nov.mxd

BARRIER INSPECTION SITE MAP

COSTCO WAREHOUSE #764
5201 SOUTH INTERMOUNTAIN DRIVE
MURRAY, UTAH

FIGURE

1



Costco Wholesale Warehouse Murray, Utah

DATE: November 21, 2022

Catch Basin Inspection Checklist

INSPECTOR: Katherine Meyr

1) Are seeps, cracks, or leaks visible in the Catch Basin?

If yes, describe:

SSDI/CB1:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	Minor dampness and/or staining was observed on the west wall from 3' below ground surface to 1' above standing water. Grout has been applied to seams where water may have previously seeped through.
		X			
SSDI/CB2:	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Minor dampness and/or staining was observed on the west wall from 3' below ground surface to 1' above standing water. Grout has been applied to seams where water may have previously seeped through.
		X			
SSDI/CB3:	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	
SSDI/CB4:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	
SSDI/CB5:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	
SSDI/CB6:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	
SSDI/CB7:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	
SSDI/CB8:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	
SSDI/CB9:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	

2) Is standing water present in the Catch Basin?

If yes, describe:

SSDI/CB1:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	1-2" of standing water observed just below outlet
SSDI/CB2:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	1-2" of standing water observed just below outlet
SSDI/CB3:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	1-2" of standing water observed just below outlet
SSDI/CB4:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	1-2" of standing water observed just below outlet
SSDI/CB5:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	
SSDI/CB6:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	1-2" of standing water observed just below outlet
SSDI/CB7:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	1-2" of standing water observed just below outlet
SSDI/CB8:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	1-2" of standing water observed just below outlet
SSDI/CB9:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	1-2" of standing water observed just below outlet

If Yes:

When was the last storm event? 11/9/2022

Have activities been conducted in the drainage area or up slope catch basin areas that may have put water in the system?

Yes ☐ No ☒

Any evidence of irrigation water going into the stormwater system?

Yes ☐ No ☒ Dampness observed in CB2 and CB3 at joints above the groundwater table, but does not reach standing water within the catch basins.

3) Is running water present in the Catch Basin?

If yes, describe:

SSDI/CB1:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	
SSDI/CB2:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	
SSDI/CB3:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	
SSDI/CB4:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	
SSDI/CB5:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	
SSDI/CB6:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	
SSDI/CB7:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	
SSDI/CB8:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	
SSDI/CB9:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	

If Yes:

When was the last storm event?

Yes ☐ No ☐ N/A

Is running water present in up slope catch basins?

Yes ☐ No ☒

Is running water present in down slope catch basins?

Yes ☐ No ☒

Corrective Action Taken:

Grout was placed in CB2, CB3, CB4, CB5, CB6, CB7, CB8, CB11, CB14, and CB22 in concrete joints and cracks at depths ranging from approximately 3 inches to 6 feet below ground surface in October 2022. The corrective action taken appears effective against the majority of the seepage from these areas that was suspected to be originating from irrigation or other surficial water. Additional repairs will be conducted to address residual, dampness and minor seepage from surficial water infiltration.



Photograph #1 – View of the north and east wall of CB1.




Photograph #2 – View of the west and south wall of CB2 with minor dampness and/or staining observed at an upper concrete joint.



Photograph #3 – View of the west wall of CB3 with and minor dampness and/or staining observed at an upper concrete joint.



Photograph #4 – View of the north wall of CB4 with grout observed in joint.

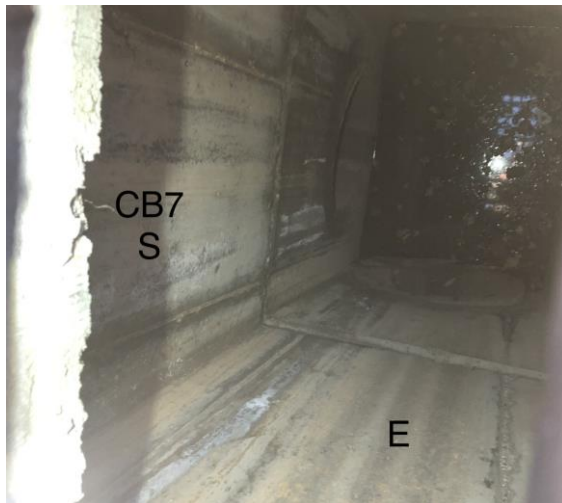
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849 West Levoy Drive, Suite 200 Salt Lake City, Utah 84123-2964 PH (801) 261-3336 FAX (801) 261-3306		MURRAY COSTCO WHOLESALE WAREHOUSE #764 5201 SOUTH INTERMOUNTAIN DRIVE MURRAY, UTAH 84107	ATTACHMENT B-1
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Photograph #5 – View of the east wall of CB5 with grout applied to vertical cracks. Minor staining was observed, but no dampness or standing water was observed.



Photograph #6 – View of the south and east wall of CB6 with grout applied to joints.



Photograph #7 – View of the south and east wall of CB7 with grout applied to vertical cracks.



Photograph #8 – View of the north wall of CB8 with grout applied to vertical cracks.



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PHOTOGRAPHIC LOG

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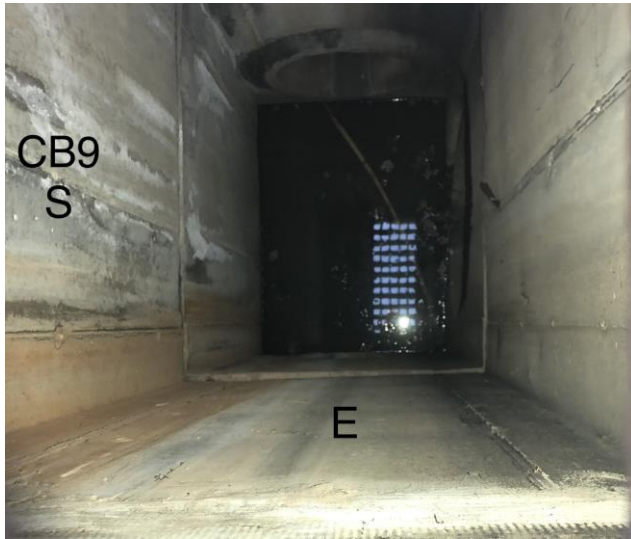
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Photograph #9 – View of the south and east walls of CB9.



Photograph #10 – View of asphalt cracks filled with tar sealant.



Photograph #11 – Example of cracks observed in asphalt.



Photograph #12 - Example of cracks observed in asphalt.



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PHOTOGRAPHIC LOG

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5201 SOUTH INTERMOUNTAIN DRIVE
MURRAY, UTAH 84107

ATTACHMENT

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NOVEMBER 2022

PROJECT NO.: 20180666

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